

SEP 2 - 1927

GEA-161-A
Supersedes GEA-161

FLOODLIGHTING

INCLUDING
SEARCHLIGHT & AIRPORT
LIGHTING



GENERAL ELECTRIC COMPANY
SCHENECTADY, N. Y.

[BLANK PAGE]



CCA

Introduction

THE modern practice of electric illumination has established new standards of utility and lofty ideals of beauty. Artificial light has become not only a potent and necessary tool of industry and commerce, but, as well, an efficient auxiliary of decorative and architectural art. The illuminating engineer, supplementing the rigid exactitude of science with a sympathetic appreciation of form and color, is exercising a profound influence on almost every activity of life—from the ordinary routine of its work to many of its finest delights.

These aspects of present-day illumination find vivid and distinguished expression in the art of floodlighting. Its field of service extends from the freight yard and wharf to the splendid creations of the architect's genius. It expedites, by night, the work of the builder and protects the completed structure from marauders who depend on the cover of darkness. From an unseen source, it silvers the temples of government, of finance, and of commerce, searching out every beauty of line and decoration, suspending them, as it were, in exquisite relief against the dark sky, and giving new emphasis to the material fabrics and to the public functions which they symbolize.

Under its beams, monuments to great men and to great causes convey their message at night as well as by day; the spectacular aspects of nature—massed foliage or mighty waterfall—preserve their charm during the hours when men are free to enjoy them; and, with more intimate touch, community playgrounds are made available, when the day's work is done, for the common recreation and the health that comes with open-air play. Floodlighting has also made possible the effective illumination of outdoor pageants, carnivals, and other spectacles, and has thus given new encouragement to a colorful art that is yearly growing in public appreciation.

Perhaps the most conspicuous triumphs of floodlighting during the last fifteen years have been at national and international expositions. Men and women, by hundreds of thousands, have carried away as their most vivid impression the glory of color that transfigured pallid buildings and sculpture, and summoned into nightly bloom a vast flower of many-hued flame. It is difficult to realize that the art which thus adorned the Panama-Pacific Exposition and which adds a flood of color to the flow of Niagara Falls is the same that safeguards the making up of a freight train or facilitates the unloading of a barge. It is only by contrasting these extremes that one can appreciate the immense scope of floodlighting in its many commercial and artistic aspects—that one can understand its important place as a constructive aid to the advance of industry and culture.

The General Electric Company has erected specially equipped laboratories in which lighting specialists, engineers and artists devote their skill and experience to new accomplishments in the technique of floodlighting—to new applications and new effects. A few of these results are pictured and described on the following pages, and a brief review is offered of the principal types of projectors in which profound research has embodied a brilliantly creative service.

NOVALUX FLOODLIGHTING PROJECTORS

FORM L-1



Fig. 1
(Photo No. 265326)
Cat. No. 166012



Fig. 2
(Photo No. 265326)
Cat. No. 189962



Fig. 3
(Photo No. 265326)
Cat. No. 195852

DESCRIPTION

The Form L-1 projector consists essentially of a 16-in. highly polished, aluminum parabolic reflector. This is secured to a cast-iron frame which also supports the lens door. The door is fastened in a closed position by means of two hinged bolts and wing nuts. A sponge-rubber gasket between the lens and door frame renders the unit weatherproof. The cast-iron socket is adjustable and is held in place by a clamp with wing nut. There are three methods of mounting these projectors:

1. Hinged to a flat base.
2. On trunnion fastened to swivel base. Wing nuts furnished for adjusting.
3. On trunnion fastened to pipe stand which is fastened to cast-iron base. Wing nuts furnished for adjusting.

Two coats of black japan finish are given to all exterior parts. Best results are obtained with the 500-watt floodlighting lamp.



Fig. 4
(Photo No. 442752)
San Joaquin Power Building, Fresno, Calif.
Felchlin Company, Architects

NOVALUX FLOODLIGHTING PROJECTORS

FORM L-3



Fig. 5
(Photo No. 265329)
Cat. No. 189668



Fig. 6
(Photo No. 265329)
Cat. No. 195865



Fig. 7
(Photo No. 265329)
Cat. No. 195866

DESCRIPTION

The L-3 projector is identical with the L-1 except the reflector. This consists of a number of sectional glass mirrors set at angles with each other and arranged in three zones. They are held together by metal strips and the entire reflector is protected by a sheet-steel casing.

This projector gives a wider angle beam than the L-1 but a shorter throw. Best results are obtained with the 500-watt floodlighting lamp. Two coats of black japan finish are applied to all external parts.



Fig. 8
(Photo No. 112502)
Pan-American Building at Washington, District of Columbia
Paul Cret, Architect

NOVALUX FLOODLIGHTING PROJECTORS

FORM L-9



Fig. 9
(Photo No. 275678)
Cat. No. 289487



Fig. 10
(Photo No. 265326)
Cat. No. 195863



Fig. 11
(Photo No. 265326)
Cat. No. 195864

DESCRIPTION

The Form L-9 projector is identical with the Form L-1 except the reflector, which is constructed of glass and coated on the outside with silver. The silvered surface is hermetically sealed with a thick copper coating which obviates the necessity for an outer casing. With a clear lens, the beam angle of this projector is slightly greater than that of the Form 1.

Best results are obtained with the 500-watt floodlighting lamp.

Two coats of black japan are applied to all external parts.



Fig. 12
(Photo No. 386564)
Dome of Capitol at Washington, D. C.

NOVALUX FLOODLIGHTING PROJECTORS

FORM L-11



Fig. 13
(Photo No. 265338)
Cat. No. 197450



Fig. 14
(Photo No. 265338)
Cat. No. 195867

DESCRIPTION

This projector is for use with a 250-watt floodlighting lamp only. The reflector frame and door construction is similar to that of the L-1. The reflector consists of a patented parabolic glass reflector, silvered and coppered. The reflector forms the casing like the reflector of the Form L-9, and is not enclosed in a sheet-metal housing. The projector can be mounted in two ways:

1. On trunnion fastened to swivel base. Wing nuts furnished for adjusting.

2. On trunnion fastened to pipe stand which is fastened to cast-iron base. Wing nuts furnished for adjusting.

Two coats of black japan finish are given to all external parts.



Fig. 15
(Photo No. 424912)
United States Playing Card Company Buildings, Cincinnati, Ohio

NOVALUX FLOODLIGHTING PROJECTORS FORM L-15



Fig. 16
(Photo No. 277381-1)
Cat. No. 3049412



Fig. 17
(Photo No. 277382-1)
Cat. No. 3049411

DESCRIPTION

This projector is a universal type and can be adapted to all classes of floodlighting. Lamps of 110 or 220 volts and from 300 to 1000 watts can be operated.

It consists of a ventilated and galvanized sheet-metal housing within which is mounted a deep composite reflector made of silvered and coppered glass. At the top of the casing and protected by a hinged ventilating cowl is the universal ball and socket focusing mechanism which permits adjustment in any direction. The projector can be mounted in two ways:

1. On trunnion fastened to swivel base. Wing nuts furnished for adjusting.

2. On trunnion fastened to pipe stand which is fastened to cast-iron base. Wing nuts furnished for adjusting.

Best results are obtained with the 1000-watt general service lamp.

Two coats of black japan finish are given to all external parts.

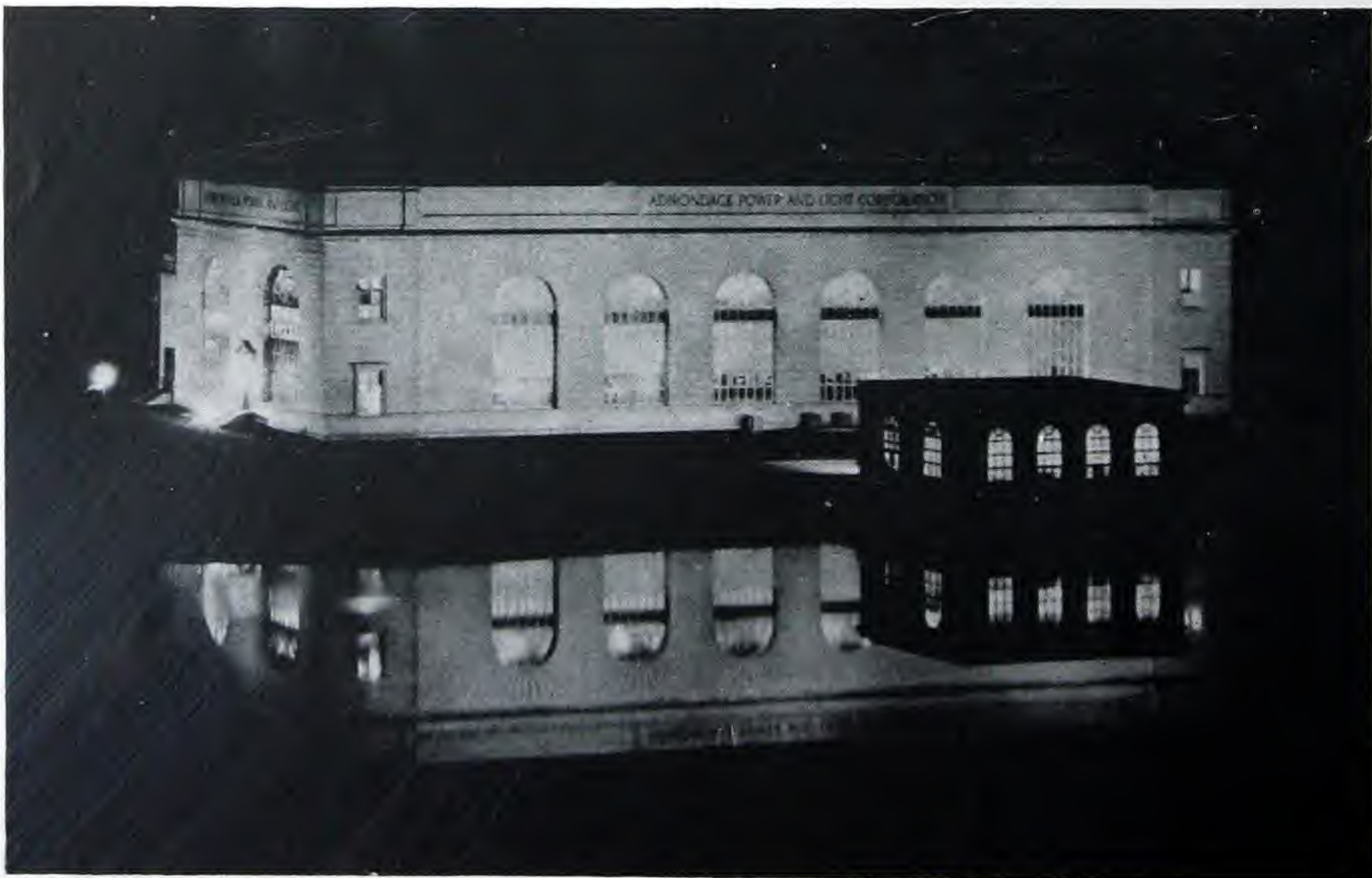


Fig. 18
(Photo No. 434367)
Adirondack Power and Light Corporation Station, Amsterdam, N. Y.
McKim, Mead and White, Architects

NOVALUX FLOODLIGHTING PROJECTORS

FORM L-20



Fig. 19
(Photo No. 270876)
Cat. No. 257660

DESCRIPTION

This projector is similar to the Form L-11 except it may be operated with a 200-watt, PS-30 general service lamp or 250-watt, G-30 floodlighting lamp. A patented parabolic glass reflector, silvered and coppered, is mounted within a sheet-metal casing. A sheet-metal door frame is hinged to the casing and fastened by a hinged bolt and wing nut.

The projector is furnished mounted on rocker fastened to swivel base.

Best results are obtained with the 200-watt general service lamp.

If the 200-watt general service lamp is used, remove the spacer which is placed between the socket and the inside of the socket holder. This change will compensate for the difference in light centers between the two lamps.

Two coats of black japan finish are applied to all external parts.



Fig. 20
(Photo No. 436152)
Montclair Memorial, Montclair, N. J.



Fig. 21
(Photo No. 428620-1)
American Radiator Company Building, New York City

NOVALUX FLOODLIGHTING PROJECTORS

Submersible Fountain Type

FORM L-23



Fig. 20
(Photo No. 277022)
Cat. No. 3049414

DESCRIPTION

This projector is constructed of non-ferrous material. The door frame, casing, and trunnion bracket are of special aluminum alloy.

It is equipped with a servicing device which consists of a large brass tube that screws into a brass base plate; and a smaller tube, assembled to the trunnion bracket, which slides inside of the larger tube. The smaller tube is slotted and fitted with three bayonet joints. These engage a stop screw which is assembled into the larger tube and projects inside it. The projector may be raised or lowered so that it can be lifted above the surface of the water in the fountain in order that the front door may be removed and the device serviced or relamped.

The front-door glass is gasketed by rubber packing, and the door casting is gasketed against the casing.

The projector has a $\frac{3}{4}$ -in. pipe-tapped hole midway of the casing for a $\frac{3}{4}$ -in. pipe nipple through which the lead cable passes. A wiped joint can be made between the brass bushing and the lead cable.

The device is also provided with two other $\frac{3}{4}$ -in. tapped holes to which a drain pipe, which may be a rubber hose or a flexible lead cable, can be attached. The reason for the two holes is that when the projector is set with the beam in the

vertical position the bottom hole can be used for draining away any condensation which may occur inside of the projector. This also permits atmospheric pressure always to be maintained within the projector. If the projector is used with the beam horizontal or nearly so, the plug in the top hole can be removed and put into the bottom hole and the drain pipe can then be put into the hole from which the plug was removed. It is very advisable when installing these projectors to put the drain pipe in because it is desirable that atmospheric pressure be maintained. Otherwise the heat from the lamp will change the density of the air inside the projector, and, when the lamp is turned off and the projector cools, there is a tendency toward a vacuum or, at least, a lower air pressure. This is likely to create a breathing effect and may, under some circumstances, cause water to enter the projector.

A sliding screw focusing mechanism is provided which allows the lamp to be moved along the axis of the reflector either up or down by pulling or pushing the bulb.

The 16-in. glass reflector is silver plated and coated with electrolytically deposited copper.

Either the 500-watt or 1000-watt, 110-volt floodlighting lamp may be used.

NOVALUX FLOODLIGHTING PROJECTORS

DIMENSIONS

(Dimensions for Reference Only—Not for Construction)

FORM	CAT. NO.	FIG. NO.	DIMENSIONS IN INCHES										
			Overall			D	E (Dia.)	F	G	H	J	K (Max.)	L
			A (Max.)	B	C								
L-1	166012	22	14 ⁵ / ₁₆	18	21	10 ¹ / ₄	14 ³ / ₈	.....	.....	.....	.....	.....	.....
L-1	189962	23	16 ¹⁵ / ₁₆	22	25 ⁵ / ₈	14 ⁷ / ₈	14 ³ / ₈	.....	.....	.....	.....	.....	.....
L-1	195852	24	16 ¹⁵ / ₁₆	22	58 ¹ / ₄	47 ¹ / ₂	14 ³ / ₈	18	4	12	2 ¹ / ₈	14 ¹⁵ / ₁₆	.....
L-3	189668	22	18 ¹¹ / ₁₆	18	21	10 ¹ / ₄	14 ³ / ₈	.....	.....	.....	.....	.....	.....
L-3	195865	23	20 ¹¹ / ₁₆	22	25 ⁵ / ₈	14 ⁷ / ₈	14 ³ / ₈	.....	.....	.....	.....	.....	.....
L-3	195866	24	20 ¹¹ / ₁₆	22	58 ¹ / ₄	47 ¹ / ₂	14 ³ / ₈	18	4	12	2 ¹ / ₈	18 ¹¹ / ₁₆	.....
L-9	195863	25	14	22	25 ⁵ / ₈	14 ⁷ / ₈	14 ³ / ₈	18	4 ¹ / ₈	12	2 ¹ / ₈	.....	.....
L-9	195864	26	14	22	58 ¹ / ₄	47 ¹ / ₂	14 ³ / ₈	18	4 ¹ / ₈	12	2 ¹ / ₈	.....	.....
L-9	289487	22	14 ⁵ / ₁₆	18	21	10 ¹ / ₄	14 ³ / ₈	.....	.....	.....	.....	.....	.....
L-11	197450	27	12 ⁹ / ₁₆	17 ¹ / ₂	20 ¹ / ₂	12	10 ¹ / ₈	13 ¹ / ₂	21 ³ / ₁₆	6 ¹ / ₄	1 ¹ / ₈	12 ¹ / ₄	.....
L-11	195867	28	15 ⁷ / ₁₆	17 ¹ / ₂	54	45 ¹ / ₂	10 ¹ / ₈	13 ¹ / ₂	21 ³ / ₁₆	12	2 ¹ / ₈	12 ¹ / ₄	.....
L-15	3049412	29	15 ¹ / ₂	21 ³ / ₈	30 ³ / ₄	17 ³ / ₄	14 ³ / ₈	16 ⁵ / ₈	8 ⁷ / ₁₆	12	.....	.....	21 ¹ / ₈
L-15	3049411	30	15 ¹ / ₂	21 ³ / ₈	62 ³ / ₄	49 ³ / ₄	14 ³ / ₈	16 ⁵ / ₈	8 ⁷ / ₁₆	12	.....	.....	53 ¹ / ₈
L-20	257660	31	12 ³ / ₁₆	15 ¹ / ₈	16	9 ¹ / ₈	.....	13 ³ / ₄	31 ⁵ / ₁₆	6	.....	14 ⁹ / ₃₂	.....
L-23	3049414	32	40	19 ³ / ₄	32	.....	.....	.....	.....	.....	.....	.....	.....

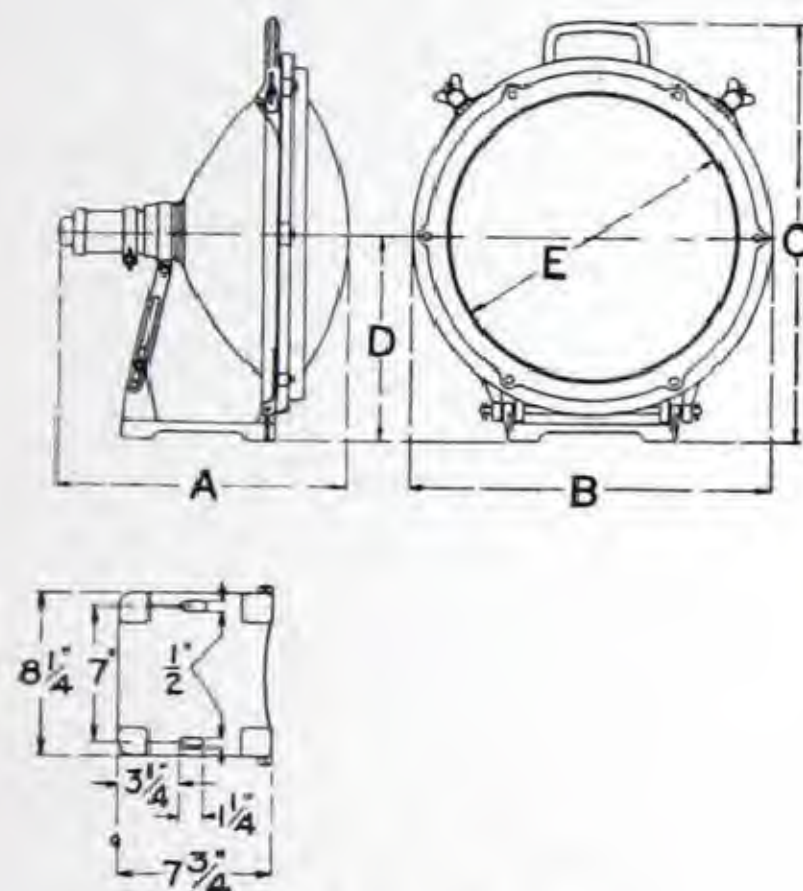


Fig. 22
(K-1222784)
Forms L-1, L-3 and L-9

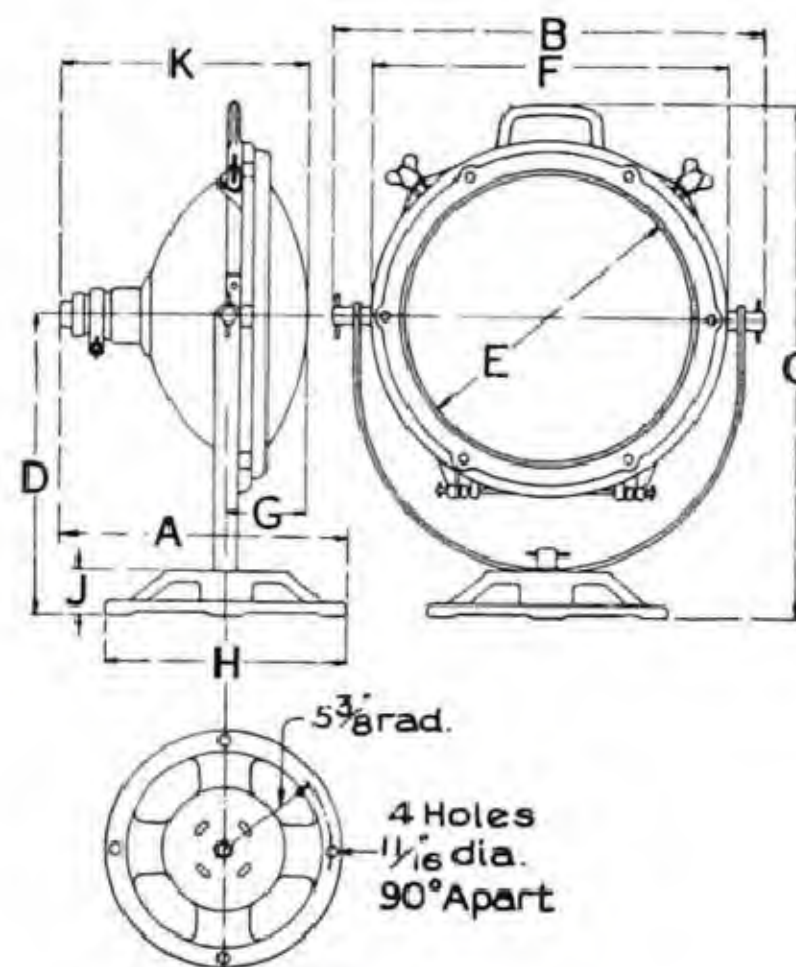


Fig. 23
(K-1217994)
Forms L-1 and L-3

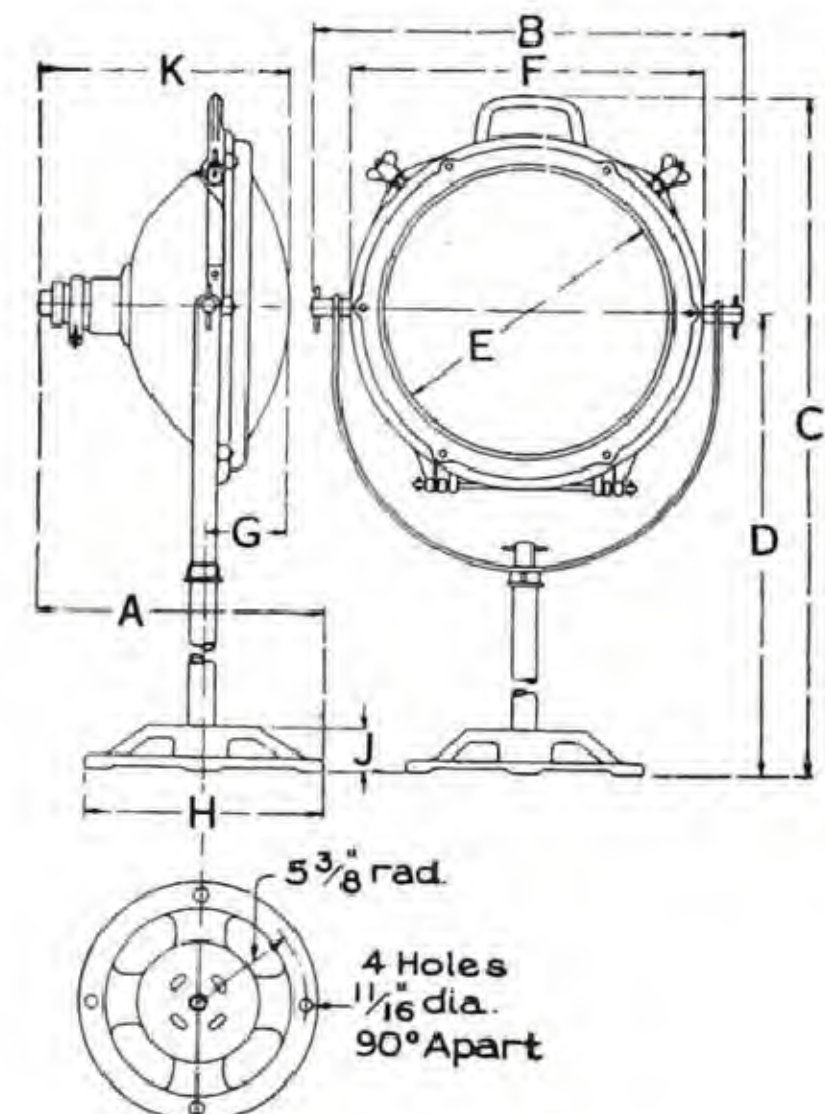


Fig. 24
(K-1217994)
Forms L-1 and L-3

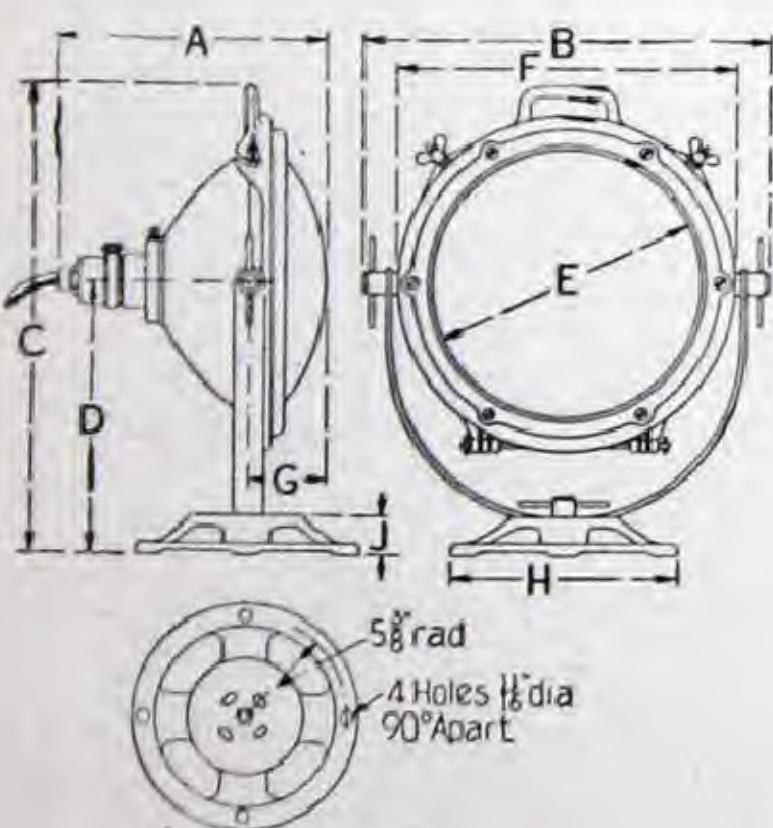


Fig. 25
(K-1222784)
Form L-9

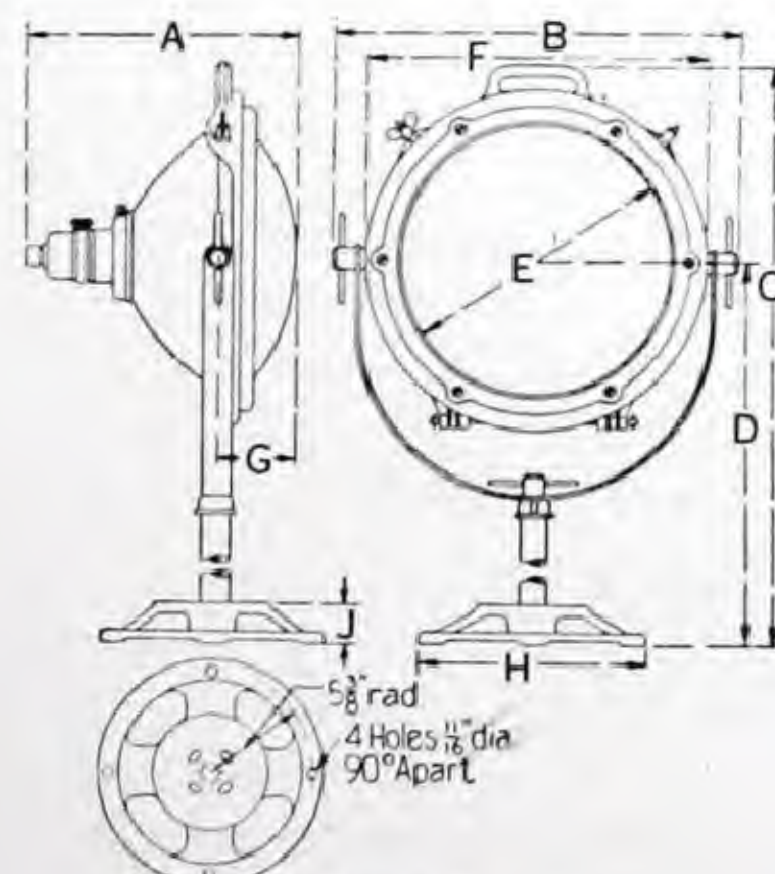


Fig. 26
(K-1222783)
Form L-9

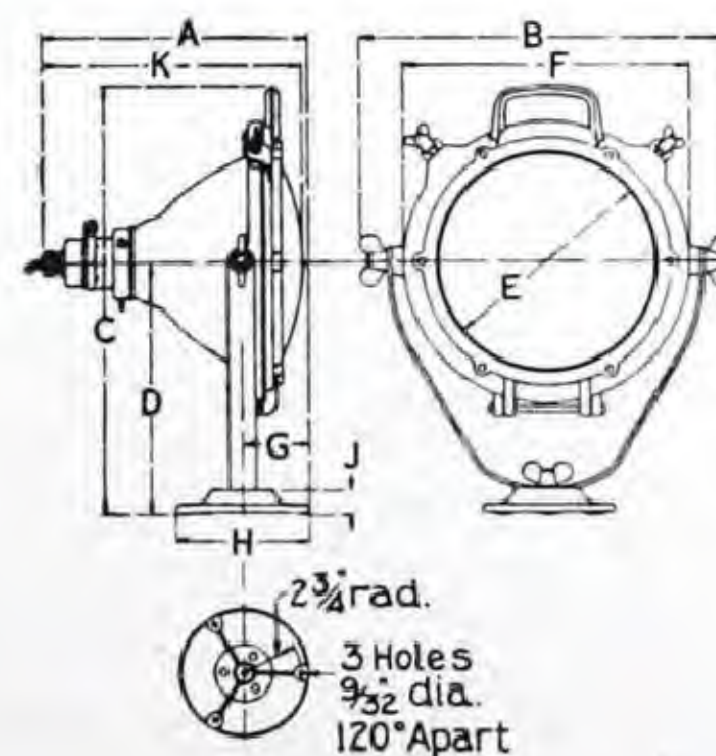


Fig. 27
(K-1222692)
Form L-11

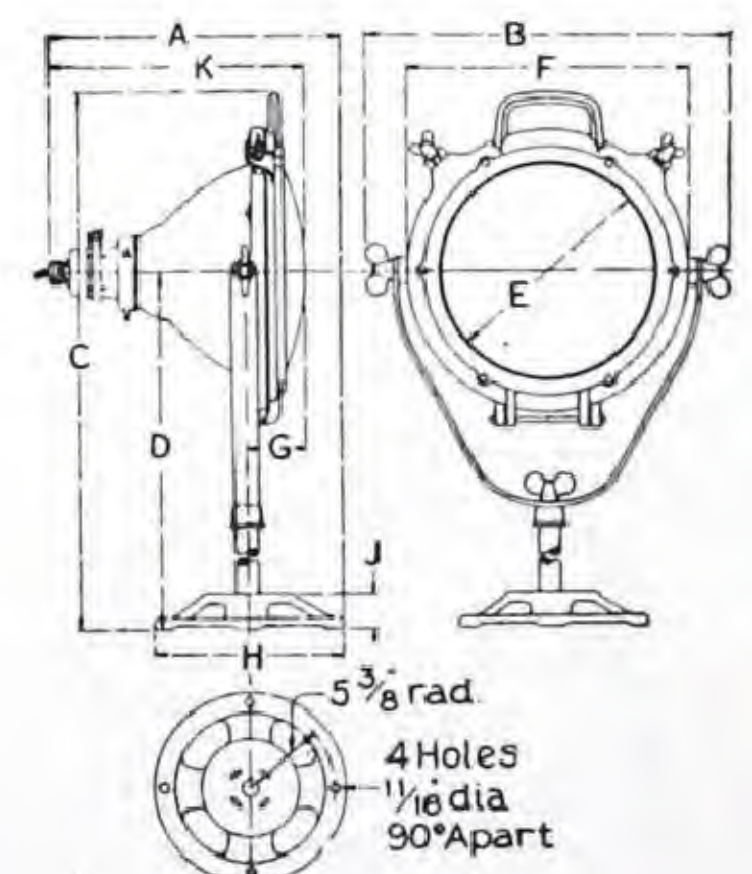


Fig. 28
(K-1222786)
Form L-11

NOVALUX FLOODLIGHTING PROJECTORS

DIMENSIONS (Cont'd)

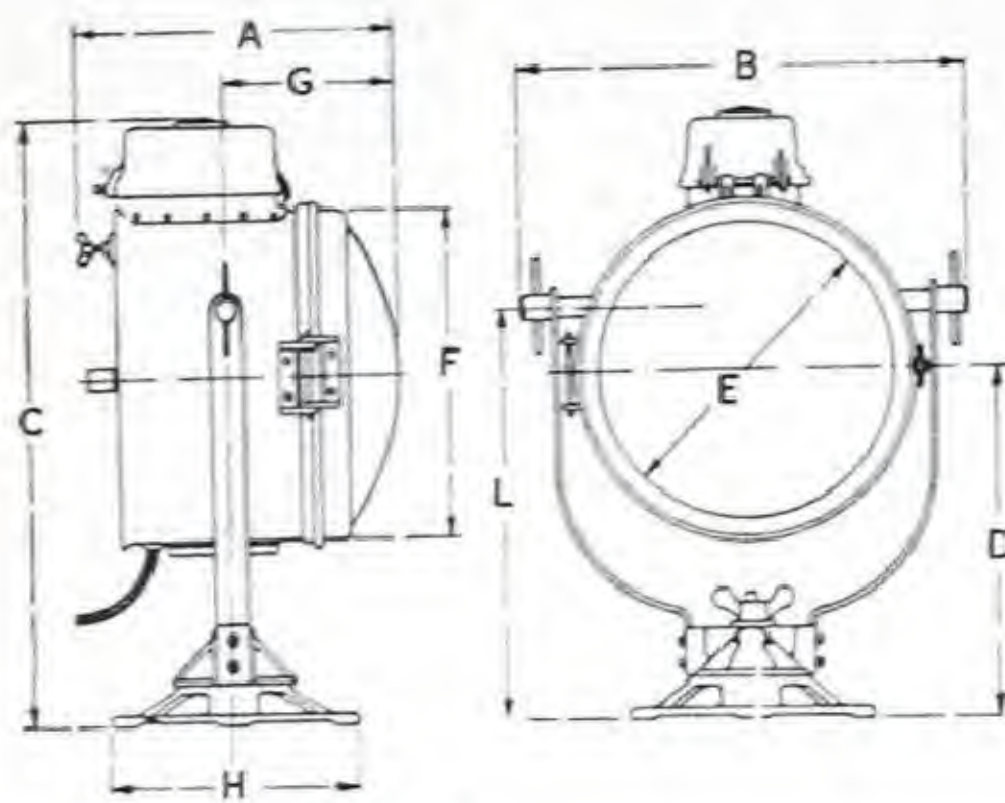


Fig. 29
(K-1238292)
Form L-15

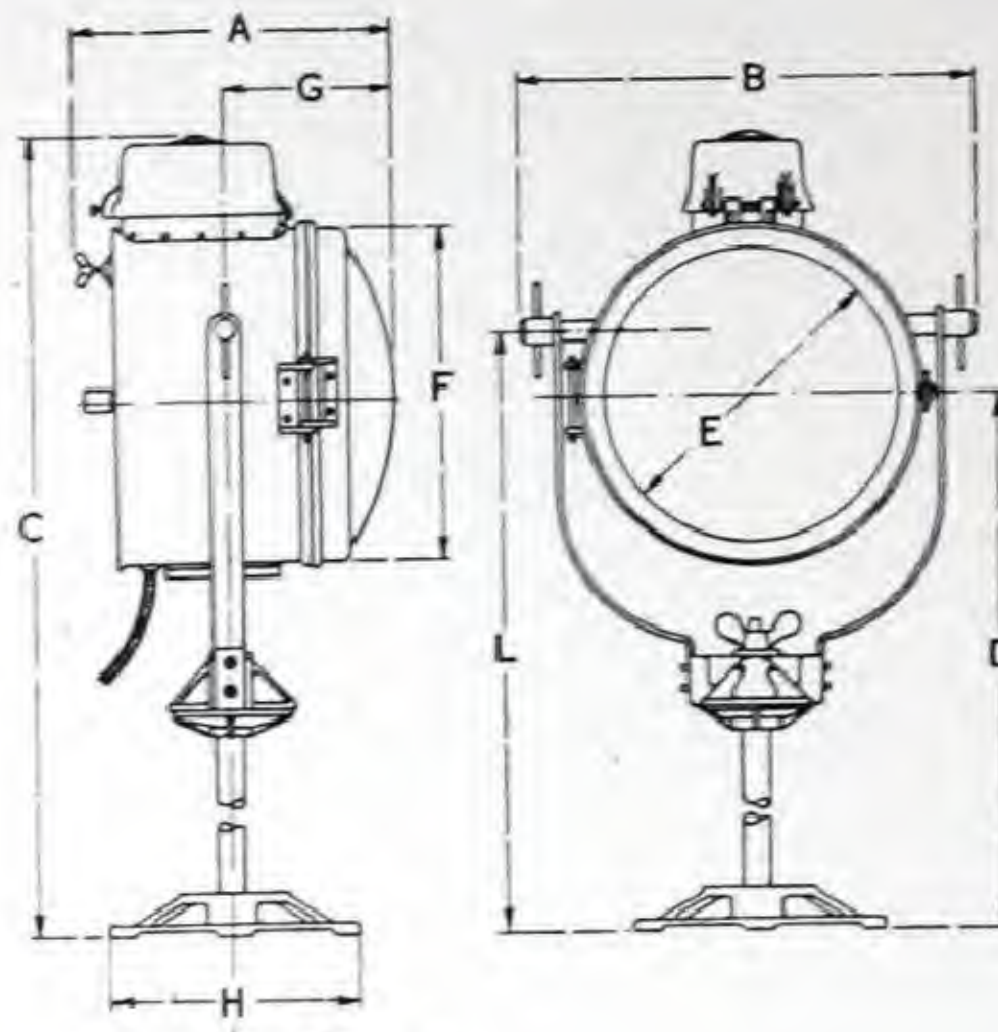


Fig. 30
(K-1238292)
Form L-15

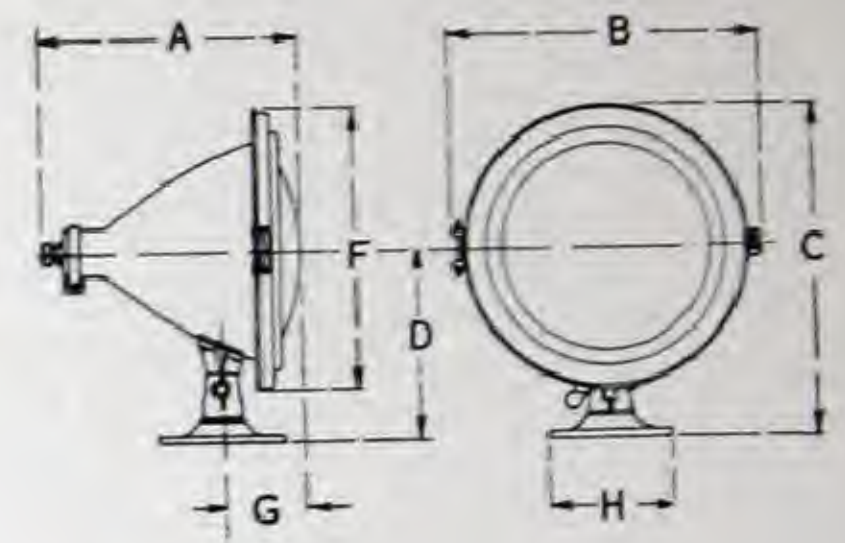


Fig. 31
(K-1238292)
Form L-20

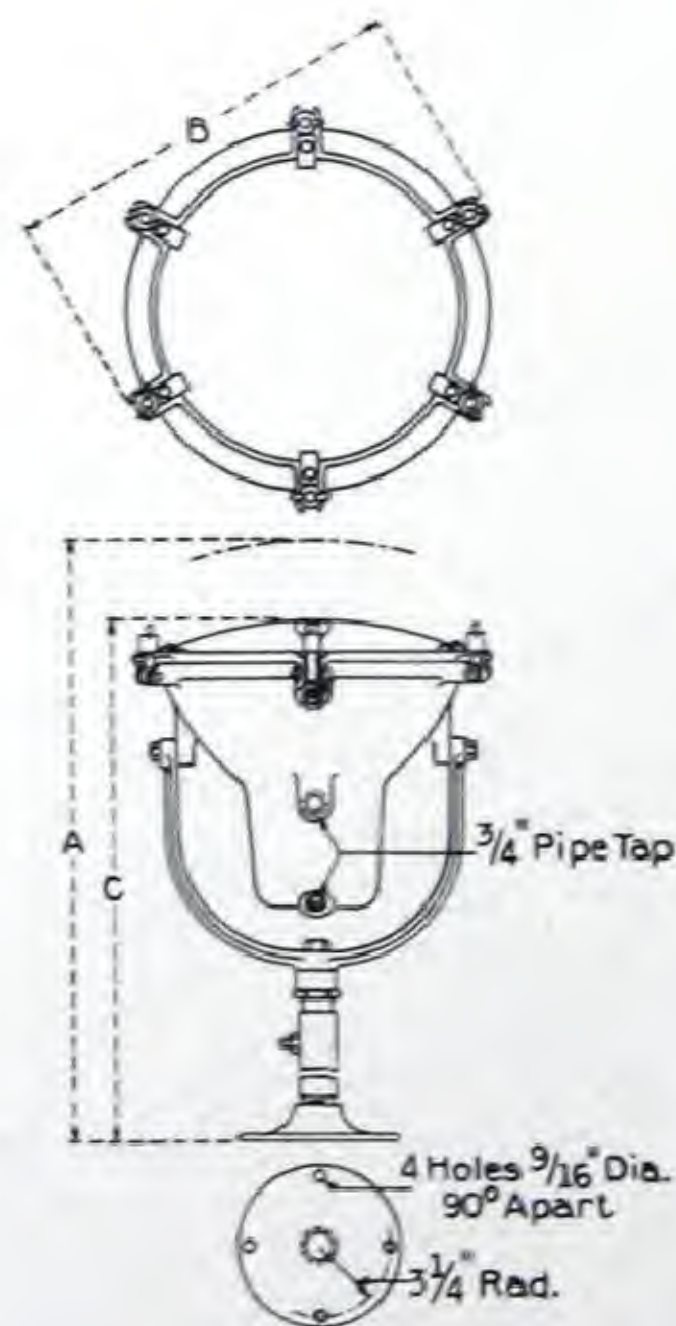


Fig. 32
(K-3717123)
Form L-23

NOVALUX FLOODLIGHTING PROJECTORS

FORMS L-1, L-3, L-9, L-11, L-15, L-20, AND L-23

For 110- and 220-volt Multiple Circuits
or with IL Series Multiple Transformer

FORM	LAMP RATING	REFLECTOR	BASE	FIG. NO.	FRONT-DOOR GLASS	CAT. NO.	(Mazda Lamps not Included)	WT. IN LB.	
							LIST PRICE Class H	Ship.	Net
L-1	Lamp Watts †G-40 500	16 In. Parabolic Aluminum	Hinged	1	Clear Heavily Stippled 40 Deg. Spreadlite	166012 2X390 3049418	\$22.00 24.20 25.00	75	31
	Swivel and Trunnion		2	Clear Heavily Stippled 40 Deg. Spreadlite	189962 2X392 3049417	24.50 26.70 27.50			
	Mogul Base		Swivel and Pipe Stand	3	Clear Heavily Stippled 40 Deg. Spreadlite	195852 2X394 3049425	25.50 27.70 28.50		
L-3	†G-40 500	16 In. Wide Angle Sectional Glass	Hinged	5	Clear Heavily Stippled 40 Deg. Spreadlite	189668 2X396 3049426	34.50 36.70 37.50	76	32
	Swivel and Trunnion		6	Clear Heavily Stippled 40 Deg. Spreadlite	195865 2X398 3049427	36.50 38.70 39.50			
	Mogul Base		Swivel and Pipe Stand	7	Clear Heavily Stippled 40 Deg. Spreadlite	195866 2X400 3049428	37.50 39.70 40.50		
L-9	†G-40 500	16 In. Medium Angle Glass	Hinged	9	Clear Heavily Stippled 40 Deg. Spreadlite	289487 3049430 3049431	32.00 34.20 35.00	79	34
	Swivel and Trunnion		10	Clear Heavily Stippled 40 Deg. Spreadlite	195863 2X402 3049432	34.00 36.20 37.00			
	Mogul Base		Swivel and Pipe Stand	11	Clear Heavily Stippled 40 Deg. Spreadlite	195864 2X403 3049433	35.00 37.20 38.00		
L-11	†G-30 250	10½ In. Parabolic Glass	Swivel and Trunnion	13	Clear Heavily Stippled 40 Deg. Spreadlite	197450 2X404 3049434	24.50 25.30 25.90	70	18
	Floodlighting Medium Base		Swivel and Pipe Stand	14	Clear Heavily Stippled 40 Deg. Spreadlite	195867 3049436 3049437	26.50 27.30 27.90		
L-15	*PS-52 1000 *PS-52 750 *PS-40 500 *PS-35 300 General Service Mogul Base	15½ In. Wide Angle Glass	Swivel and Trunnion	16	Lightly Stippled Heavily Stippled 40 Deg. Spreadlite	† 3049412 2X405 3049435	54.00 56.20 57.00	130	59
	Swivel and Pipe Stand		17	Lightly Stippled Heavily Stippled 40 Deg. Spreadlite	† 3049411 2X406 3049438	55.50 57.70 58.50			
L-20	PS-30 200 General Service or G-30 250 Floodlighting Medium Base	10½ In. Parabolic Glass	Swivel and Rocker	19	Clear Heavily Stippled 40 Deg. Spreadlite	257660 2X407 3049439	30.50 31.30 31.90	70	18
L-23	G-40 500 G-40 1000 Floodlighting Mogul Base	16 In. Medium Angle Glass	Swivel and Pipe Stand	20	Clear	3049414	83.00	85	37

Prices subject to change without notice.

* General service lamps can be purchased for 110, 115, 120 or 220, 230, 240, and 250 volts.

† Floodlighting lamps can be purchased only for 110, 115, and 120 volts.

‡ Lightly stippled front-door glass recommended although L-15 projector can be furnished with clear front-door glass if desired, at same price. If L-15 projector with clear front-door glass is desired specify Cat. No. 224810 instead of Cat. No. 3049412 or Cat. No. 224811 instead of Cat. No. 3049411.

(1) If plain Red, Amber, Blue, or Green front-door glass is required for L-1, L-3, L-9, L-15, or L-23 add \$5.30 to List Price of projector with clear lens. Stippled colored lens not available.

(2) If plain Red, Amber, Blue, or Green front-door glass is required for L-11 or L-20 add \$3.00 to List Price of projector with clear lens. Stippled colored lens not available.

(3) Mogul sockets furnished on L-1, L-3, and L-9 projectors. If 250-watt lamp is to be used specify when ordering to add Cat. No. GE070 adapter, no addition in price.

(4) For lead plating the L-15 projector add \$4.25 to List Price.

APPLICATION

Briefly, a floodlighting projector consists of a reflector and socket mounted in a weatherproof casing and arranged to take a focus-type MAZDA lamp.

The socket can be moved forward or backward in order to focus the lamp; when the proper focus is obtained, the socket can be locked in position. All parts are readily accessible, and the units are weatherproof and can be mounted either outdoors or indoors.

It is possible economically and effectively to illuminate surfaces where lighting by the ordinary method of employing several lamps and reflectors is impractical.

Following are a few of the uses of floodlighting:

Floodlighting Public Buildings, Monuments, Fountains, etc.

Every municipality has some notable example of architecture, a statue, a square, or historical place in which the community has considerable pride. The floodlighting projector makes possible the illumination of any such structure and gives it prominence by night.

Floodlighting Billboards and Signs

G-E floodlighting projectors for billboard lighting can be installed in practically any convenient place; obviating the use of complicated wiring, increasing the working hours of the billboard, and enhancing the advertising value through the contrast of the bright surface against the dark background of night.

Floodlighting in Construction Work

Wherever contractors are called upon to do construction work at night they will find G-E floodlighting projectors of considerable assistance. Temporary installations can be easily and quickly made.

Floodlighting for Protection

Important railroad bridges, docks, power stations, aqueducts, reservoirs, etc. that are nightly guarded against mischief-makers and prowlers are much more completely protected when G-E floodlighting projectors are used.

Floodlighting of Winter Sports

For lighting winter carnivals, toboggan slides, skating ponds, hockey, curling, and skating rinks, the G-E floodlighting projector is particularly useful because it provides a powerful light and obviates the necessity of poles which often become dangerous obstructions.

Floodlighting for Pageants

The floodlighting projector is inherently suited to the lighting of pageants, carnivals, outdoor expositions, displays during merchants' weeks, etc.

Floodlighting Athletic Grounds

Floodlights, mounted on poles adjacent to the grounds or on the tops of the stands and buildings of the grounds, have made it possible to hold athletic meets and to play football and baseball games at night.

NOVALUX FLOODLIGHTING PROJECTORS

METHOD OF SOLVING FLOODLIGHTING PROBLEMS

ILLUMINATION DATA

FORM	WORKING DISTANCE	LAMP 115-VOLT	FRONT-DOOR GLASS	BEAM			TOTAL LUMENS	F	PHOTO-METRIC CURVE
				Angle in Deg.	Candles	Lumens			
L-1	Up to 400 Ft.	500 Watt Floodlighting	Clear Heavily Stippled 40 Deg. Spreadlite	11 60	168000 104000	2000 2460	4840 4620	0.19 1.15	C-61,137 C-61,249
L-3	Up to 100 Ft.	500 Watt Floodlighting	Clear Heavily Stippled 40 Deg. Spreadlite	50 90	21000 6500	3270 4320	4950 4680	0.93 2.00	C-61,148 C-61,149
L-9	Up to 400 Ft.	500 Watt Floodlighting	Clear Heavily Stippled 40 Deg. Spreadlite	12 50	310000 22800	3405 3840	6100 5780	0.21 0.93	H-130,841 H-130,842
L-11	Up to 200 Ft.	250 Watt Floodlighting	Clear Heavily Stippled 40 Deg. Spreadlite	14	52000	990	1800	0.25	C-61,242
L-15	Up to 175 Ft.	1000 Watt General Service	Lightly Stippled Heavily Stippled 40 Deg. Spreadlite	37 86	67500 18700	6900 8700	12640 10900	0.67 1.87	H-131,634 C-61,221
L-20	85 to 200 Ft.	250 Watt Floodlighting	Clear	14	52000	990	1800	0.25	Same as C-61,242
		or	Heavily Stippled 40 Deg. Spreadlite						
		200 Watt General Service	Clear Heavily Stippled 40 Deg. Spreadlite	32 65	16500 4900	1250 1320	1980 1755	0.57 1.27	H-107,613 H-107,614

Beam diameter in feet = Distance from projector in feet \times Factor F.

INTENSITIES FOR FLOODLIGHTING

BUILDING SURFACES	CHARACTER OF SURROUNDINGS		
	White Way	Residences	Parks
Dark-colored buildings, i.e., surfaces of red brick, clinker brick, brown stone, etc. . . .	20 F.C.	15 F.C.	10 F.C.
Medium-colored buildings, i.e., surfaces of concrete, granite, etc.	15 F.C.	10 F.C.	5 F.C.
Light-colored buildings, i.e., surfaces of glazed terra cotta, marble, etc.	10 F.C.	5 F.C.	3 F.C.

TYPICAL PROBLEM

Assume a light-colored building, 100 by 80 ft., total area 8000 sq. ft. Location, residential section. Units must be installed 25 ft. from surface to be illuminated.

What type of floodlighting unit, foot-candle intensity, and number of units are required?

FORMULA FOR NUMBER OF PROJECTORS

$$N = \frac{A \times E}{L} \begin{cases} N = \text{Number of projectors.} \\ A = \text{Area of building façade.} \\ E = \text{Foot-candle intensity required.} \\ L = \text{Beam lumens delivered by one projector.} \end{cases}$$

SOLUTION OF PROBLEM

Factors given: Working distance, 25 ft.; surroundings, residential section; surface of building, light. (8000 sq. ft.)

Refer to the formula for beam diameter in feet given above and at a working distance of 25 ft. The L-3 projector is selected because its beam covers a large area, being a wide angle projector and it proves to be the most economical projector for this application.

The table of intensities shows that a light-colored surface in a residential section requires 5 foot-candles.

Refer to formula

$$N = \frac{A \times E}{L} \quad A = 8000; \quad E = 5; \quad L = 3270$$

$$N = \frac{8000 \text{ (sq. ft. area)} \times 5 \text{ (foot-candles)}}{3270 \text{ (beam lumens—Form L-3)}}$$

$$N = 12.2, \text{ or } 12 \text{ projectors}$$

Reasonable allowance should be made for overlapping of beams so as to produce an adequate and even illumination over the area to be floodlighted. Beam diameter can be determined from formula above.

The illuminating engineering laboratory of the General Electric Company will give floodlighting recommendations concerning objects to be illuminated upon receipt of further data as follows:

- Size and color.
- Distance between objects.
- Locations suitable for projectors.
- Nature of lighting in the vicinity.

LAMP DATA

USED WITH	WATTS	VOLTS	BASE	BULB (Clear Glass)	LIFE in Hours	LUMENS	LIGHT Center LENGTH (In.)	MAXIMUM OVERALL DIMENSION (In.)	SERVICE	† LIST PRICE	STD. PKG. QTY.
L-1, L-3, L-9 and L-23 Projectors	500	110, 115, 120	Mogul	G-40	800	8150	4 1/4	7 1/16	Floodlighting	\$3.25	12
L-11 and L-20 Projectors	* 250	110, 115, 120	Medium	G-30	800	3375	3	5 5/8	Floodlighting	1.75	24
L-15 Projector	300	110, 115, 120	Mogul	PS-35	1000	5400	7	9 7/16	General	1.25	24
L-15 Projector	500	110, 115, 120	Mogul	PS-40	1000	9600	7	9 13/16	General	2.00	12
L-15 Projector	750	110, 115, 120	Mogul	PS-52	1000	15000	9 1/2	13 1/8	General	3.50	8
L-15 Projector	1000	110, 115, 120	Mogul	PS-52	1000	21000	9 1/2	13 1/8	General	3.75	8
L-20 Projector	200	110, 115, 120	Medium	PS-30	1000	3200	6	8 1/8	General	.80	24
L-23 Projector	1000	110, 115, 120	Mogul	G-40	800	18000	5 3/16	7 7/8	Floodlighting	6.75	12

* This lamp can also be used in the L-1, L-3, and L-9 projectors with an adapter Cat. No. GE070.

† Subject to regular incandescent lamp discounts.
Prices subject to change without notice.

NOVALUX FLOODLIGHTING PROJECTORS

For Railroad Classification Yards and Other Large Area Lighting

For 110- and 220-volt Multiple Circuits or with IL Series Multiple Transformer

FORM	LAMP RATING POSITION OF BURNING	DEFLECTOR	FIG. NO.	FRONT-DOOR GLASS	CAT. NO.	LIST PRICE △ Class H (MAZDA Lamps not Included)	WT. IN LB.	
							Ship.	Net
L-22 (Ventilated)	Lamp Watts * PS-52 1500 * PS-52 1000 * PS-52 750 General Service Burn Base Up Mogul Base	With Visor	1 and 2	Clear	295396	\$134.00	181	81
				Lightly Stippled	295397	134.00	181	81
		Without Visor Standard Equipment	1 and 2	Clear	289765	125.00	176	76
				Lightly Stippled	270504	125.00	176	76
L-24 (Totally enclosed)	* PS-52 1000 * PS-52 750 General Service Burn Base Up Mogul Base	With Visor Standard Equipment	3	Clear	295398	134.00	175	75
				Lightly Stippled	295399	134.00	175	75
		Without Visor		Clear	3049401	125.00	170	70
				Lightly Stippled	3049395	125.00	170	70
L-25 (Totally enclosed)	† G-40 1000 Floodlighting Burn Base Down Mogul Base	With Visor Standard Equipment	4	Clear	295400	134.00	175	75
				Lightly Stippled	295401	134.00	175	75
		Without Visor		Clear	3049410	125.00	170	70
				Lightly Stippled	3049409	125.00	170	70

△ Railroads are entitled to the same discount as G-E Distributors.

* General service lamps can be purchased for 110, 115, 120 or 220, 230, 240, and 250 volts.
† Floodlighting lamps can be purchased for 110, 115, and 120 volts.

Visor only Cat. No. 3706328P1—\$9.00 List—△ Class H.

Prices subject to change without notice.



Fig. 1
(Photo No. 273867)
Form L-22 Floodlighting Projector
with Lightly Stippled Glass Door



Fig. 2
(Photo No. 273871)
Form L-22 Floodlighting Projector
with Clear Glass Door
(Showing hinged sections of
Casing and Reflector)

APPLICATION

ADVANTAGES OF RAILROAD YARD LIGHTING

Over two-thirds of the gross income of our railroads is derived from the handling of freight. This movement of freight cars is continuous and anything which tends to expedite this movement with a decreased breakage and theft loss and with less chance of danger to the train operators is of the utmost importance not only to the railroads, but also to our economic life. Statistics compiled by some of our larger railroad systems prove the many advantages of proper lighting of the railroad yard.

The Committee on Illumination of the Association of Railroad Electric Engineers in November, 1923, reported the following advantages of yard lighting:

- (1) Speeding up of cars handled in the yard at night.
- (2) Reduction in cars damaged by rough handling and collision in the classification, yard with consequent reduction in claims, delay in delivery of goods, loss of service of damaged cars, etc.
- (3) Reduction in losses due to pilfering, on account of more effective policing possible in a well-illuminated yard.
- (4) Improved working conditions and increased safety for employees working in the yard.

The importance of these benefits is evidenced by the fact that certain railroads have during the past year authorized relatively large expenditures for improved yard illumination.

NOVALUX FLOODLIGHTING PROJECTORS

FORMS L-22, L-24, AND L-25

APPLICATION (Cont'd)

GENERAL REQUIREMENTS

In past years both pendent units and floodlighting projectors have been utilized for this service but at the present time opinion is almost universal that the most effective results are to be obtained by the use of floodlighting projectors. The requirements of a projector for service in the railroad yard are most severe. Satisfactory results can be obtained only with projectors which have been designed and constructed for this specific duty.

Material

Because of the fact that injurious gases from the smoke of the locomotives are ever present in the railroad yard, it is most important that the material from which the unit is constructed be impervious to attack from these gases. The units

Photometric Results

The determining factor on the quantity of light in the yard is the value of beam lumens from the projector; consequently careful consideration should be given to the efficiency of the unit. Since in many cases the throw is 1000 ft. or more, the unit must have a high value of central beam candle power. Towers and space in the railroad yard are very expensive and anything that can be done to reduce the number of projectors necessary to light a given area is a most important consideration. With the above-mentioned points in mind, the engineers of the General Electric Company have developed railroad yard lighting projectors which possess all these advantages, as may be observed from an examination of the construction specifications listed below.

Because of their high lighting efficiency these projectors are most economical. They are suitable for intensive large-



Fig. 3
(Photo No. 277378)
Form L-24 Floodlighting Projector
With Visor



Fig. 4
(Photo No. 277397)
Form L-25 Floodlighting Projector
With Visor

are at all times exposed to the weather and should, therefore, be weatherproof and of a material which does not rust. These two requirements indicate that a cast aluminum alloy construction would be most suitable.

Mechanical Details

The projectors are as a rule mounted on high towers where space for the electrician or maintenance man is limited. In many cases the platform from which these men must operate is at the rear of the unit and in such cases it is most important that they be able to relamp or clean the projector from the rear without changing the direction of the beam. The best way to provide for this is by the use of a unit which has a hinged back door.

area lighting and are particularly adapted for the lighting of railroad yards and the floodlighting of large buildings and signs. Standard 110- or 220-volt, 750- to 1000-watt, general service (base up) burning lamps can be used in the L-22 and L-24 projectors while the 110-volt, 1000-watt (base down) burning floodlighting lamp can be used in the L-25 projector. The most economical results are obtained with the larger lamps.

RECOMMENDATIONS

It is not recommended that the L-22 projector be used for railroad yard lighting unless it is desired to use the 1500-watt lamp. This is essentially a large-area unit.

The L-24 and L-25 projectors are better adapted for railroad yards on account of being dustproof, but must **never** be used with lamps exceeding 1000 watts capacity.

CONSTRUCTION

The units have a cone-shaped, two-part casing of aluminum alloy and a hinged front door and a hinged rear section for relamping or cleaning, from the back of the projector, without disturbing the direction of the beam. The focusing mechanism is of the split ball and socket type with

retarding spring and single clamping screw, allowing movement of the socket in any direction. This movement is absolutely necessary in order to focus accurately the lamp. The retarding spring prevents lamp breakage and further facilitates focusing.

NOVALUX FLOODLIGHTING PROJECTORS

FORMS L-22, L-24, AND L-25

CONSTRUCTION (Cont'd)

The L-22 projector is provided with shielded outlets at the top and bottom for ventilation and can use the 1500-watt lamp. The L-24 and L-25 projectors are totally enclosed.

The L-22 and L-24 projectors have the lamp socket at the top arranged for base-up burning lamps while the L-25 projector has the lamp socket at the bottom arranged for base-down burning lamp.

Each projector is provided with two reflectors; the front unit, of patented parabolic shape, is attached to the stationary part of the projector; the rear unit, of shallow parabolic and spherical sections, is attached to the movable rear door. These reflectors are of blown glass, silvered and hermetically sealed by a heavy coating of electrolytic copper which entirely envelops the outer surface of the mirror. The copper coating, in addition to protecting the glass, assists in radiating the heat from the lamp. This particular design of composite reflector gives a greatly increased value of central beam candle power and beam lumens over other comparable projectors.

The front door is fitted with heat-resisting, pressed glass, either clear or lightly stippled. The light stipple in the glass tends to smooth out any high spots in the beam.

The casing and door of the projector are of cast aluminum; the ventilating cowl is of copper. All screws and bolts are of non-rusting materials.

The trunnion bracket is band iron, heavily lead plated. The swivel and base are cast-iron, heavily lead plated. This trunnion bracket and swiveled base allow the adjustment of the beam in any direction.

All joints are made weatherproof by the use of sponge-rubber gaskets.

HOW TO FOCUS

In focusing, care should be taken to see that the center of the lamp filament is in the exact center of the rear reflector. It is also important that the filament be brought into the focal point along the horizontal axis at right angles to the adjustment mentioned above.

ILLUMINATION DATA

FORM	WORKING DISTANCE	LAMP 115 VOLT	FRONT-DOOR GLASS	BEAM			TOTAL LUMENS	F	PHOTOMETRIC CURVE
				Angle	Candles	Lumens			
L-22	Up to 1500 ft.	1500-watt General Service	Clear	22°	336,000	13,100	21,500	0.39	H-131443
			Lightly Stippled	28°	232,000	12,350	20,900	0.50	H-131444
			Clear	20°	275,000	8,750	15,000	0.35	H-130983
			Lightly Stippled	32°	140,000	9,400	14,500	0.57	H-130984
L-24	Up to 1500 ft.	1000-watt General Service	Clear	20°	275,000	8,750	15,000	0.35	H-130983
			Lightly Stippled	32°	140,000	9,400	14,500	0.57	H-130984
L-25	Up to 1500 ft.	1000-watt Floodlighting	Clear	14°	550,000	7,000	12,950	0.25	H-131590
			Lightly Stippled						

Beam diameter in feet = Distance from projector in feet × Factor F.

LAMP DATA

USED WITH	WATTS	VOLTS	BASE	PULB (Clear Glass)	LIFE in Hours	LUMENS	LIGHT CENTER LENGTH (In.)	MAXIMUM OVERALL DIMENSION (In.)	SERVICE	LIST PRICE	STD. PKG. QTY.
L-22 Projector	1500	110, 115, 120	Mogul	PS-52	1000	30,000	9 1/2	13 1/8	General	\$5.00	8
L-22 and L-24 Projectors	1000	110, 115, 120	Mogul	PS-52	1000	21,000	9 1/2	13 1/8	General	3.75	8
L-22 and L-24 Projectors	750	110, 115, 120	Mogul	PS-52	1000	15,000	9 1/2	13 1/8	General	3.50	8
L-25 Projector	1000	110, 115, 120	Mogul	G-40	800	18,000	5 3/16	7 7/8	Floodlighting	6.75	12

Prices subject to change without notice.

DIMENSIONS

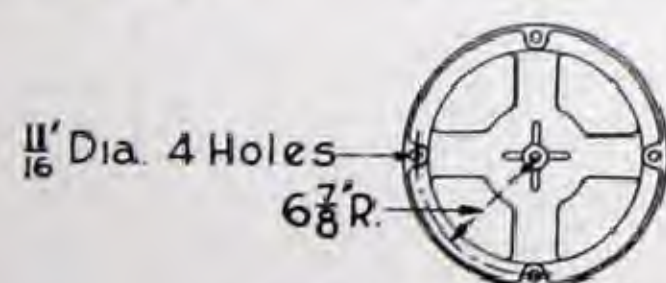
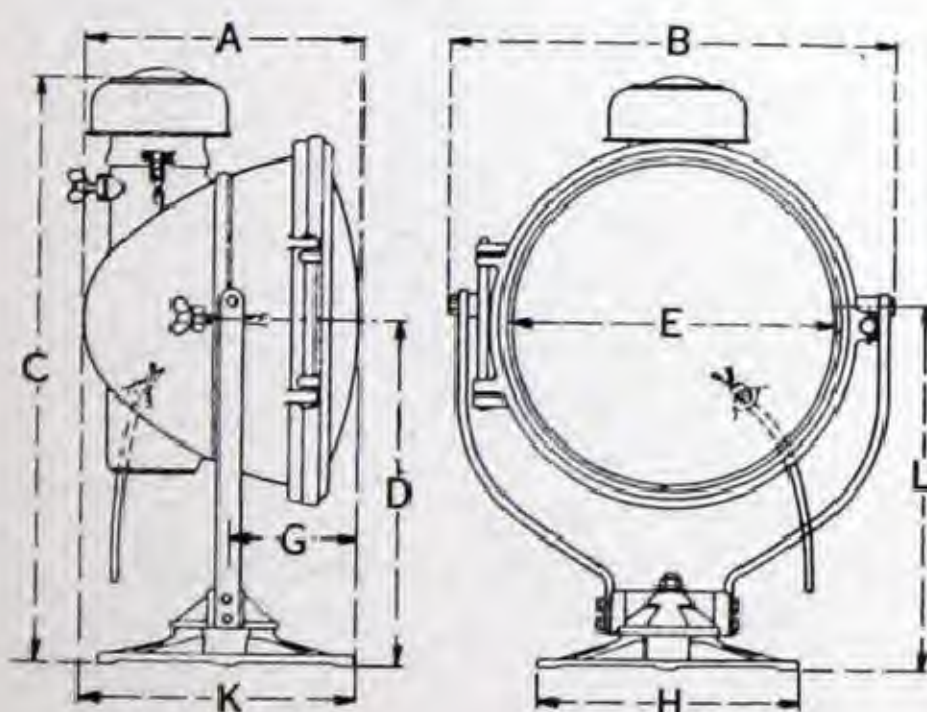


Fig. 5
(K-1257798)

Form L-22 Floodlighting Projector

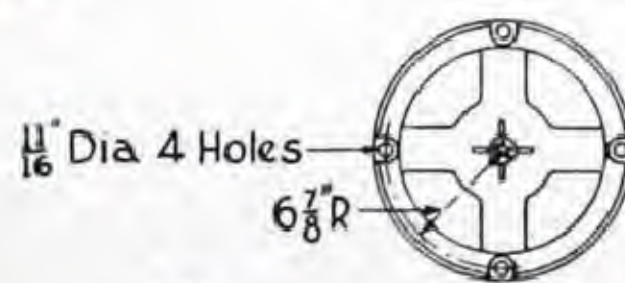
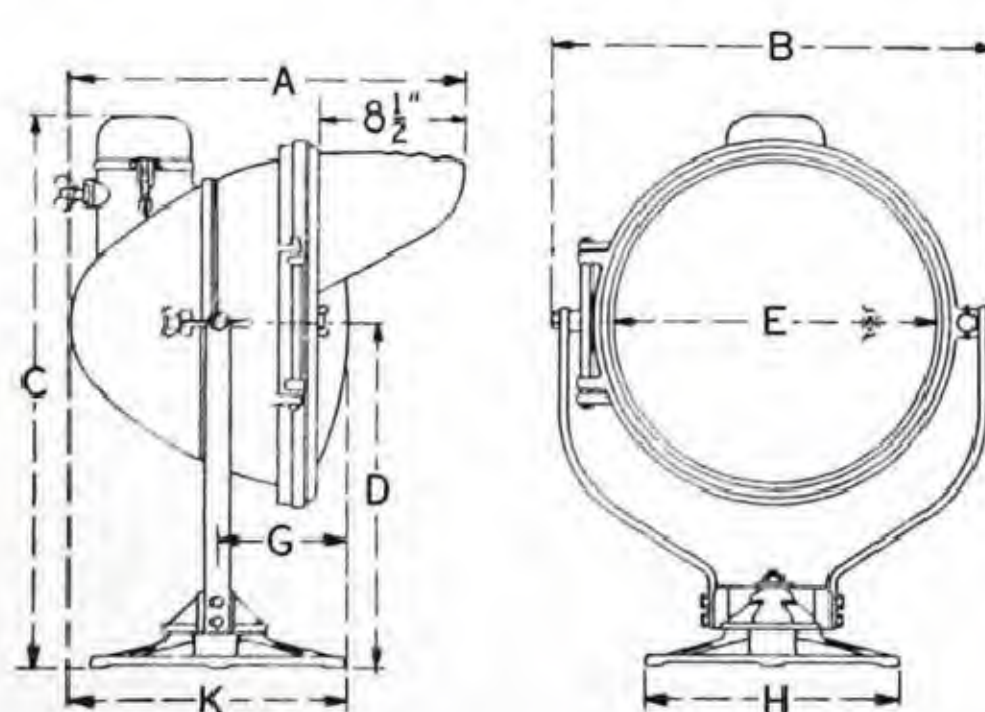


Fig. 6
(K-1279441)

Form L-24 Floodlighting Projector

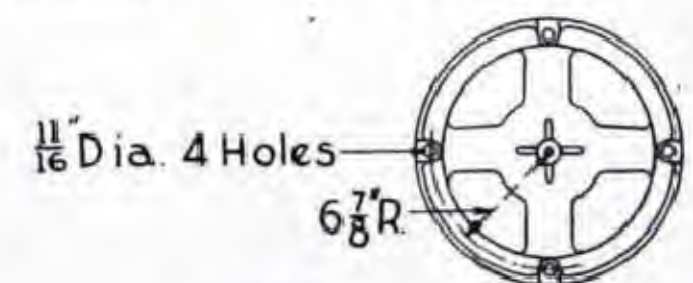
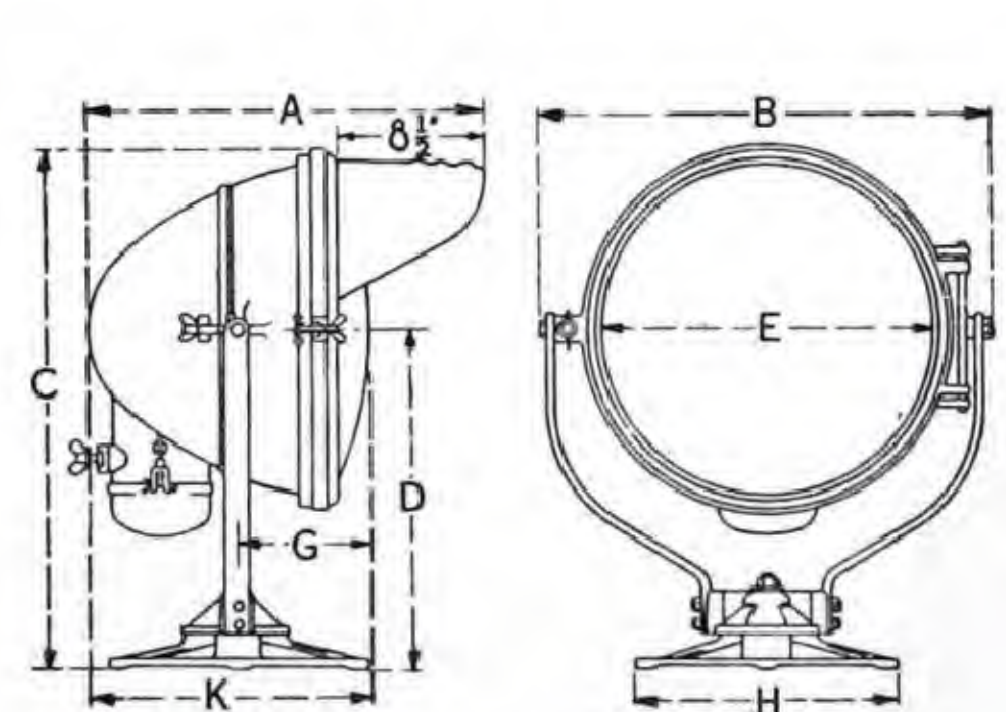


Fig. 7
(K-1279466)

Form L-25 Floodlighting Projector

FORM	FIG. NO.	DIMENSIONS IN INCHES								
		A	B	C	D	E	G	H	K	L
L-22	5	16	26	33 1/4	19 1/16	19	6 5/8	15	16	20
L-24	6	22 3/4	25 7/8	32 3/4	19 15/16	19	6 5/8	15	16	..
L-25	7	22 3/4	25 1/8	30 13/16	19 15/16	19	6 5/8	15	16	..

NOVALUX INCANDESCENT SEARCHLIGHTS

DIMENSIONS

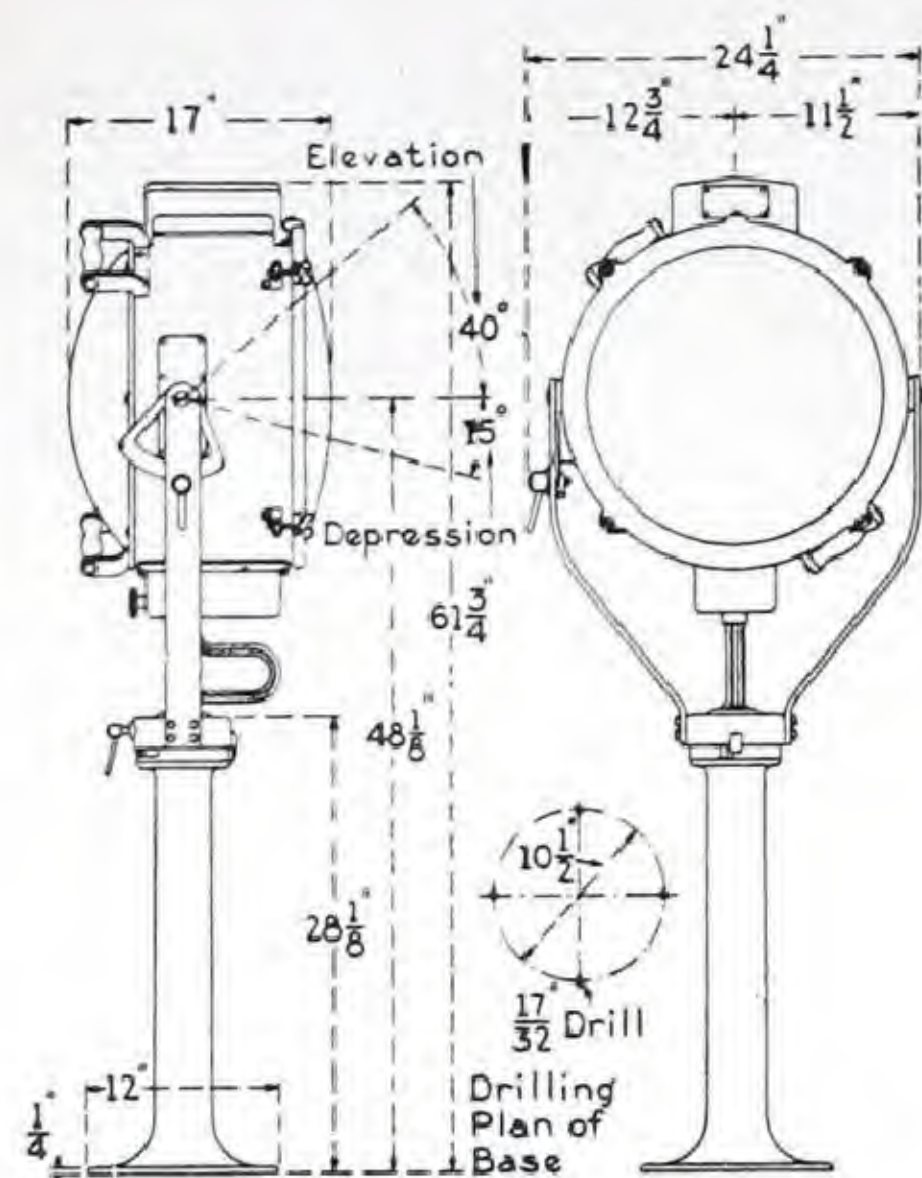


Fig. 6
(T-1256086)
18-in. Hand-control Incandescent Searchlight

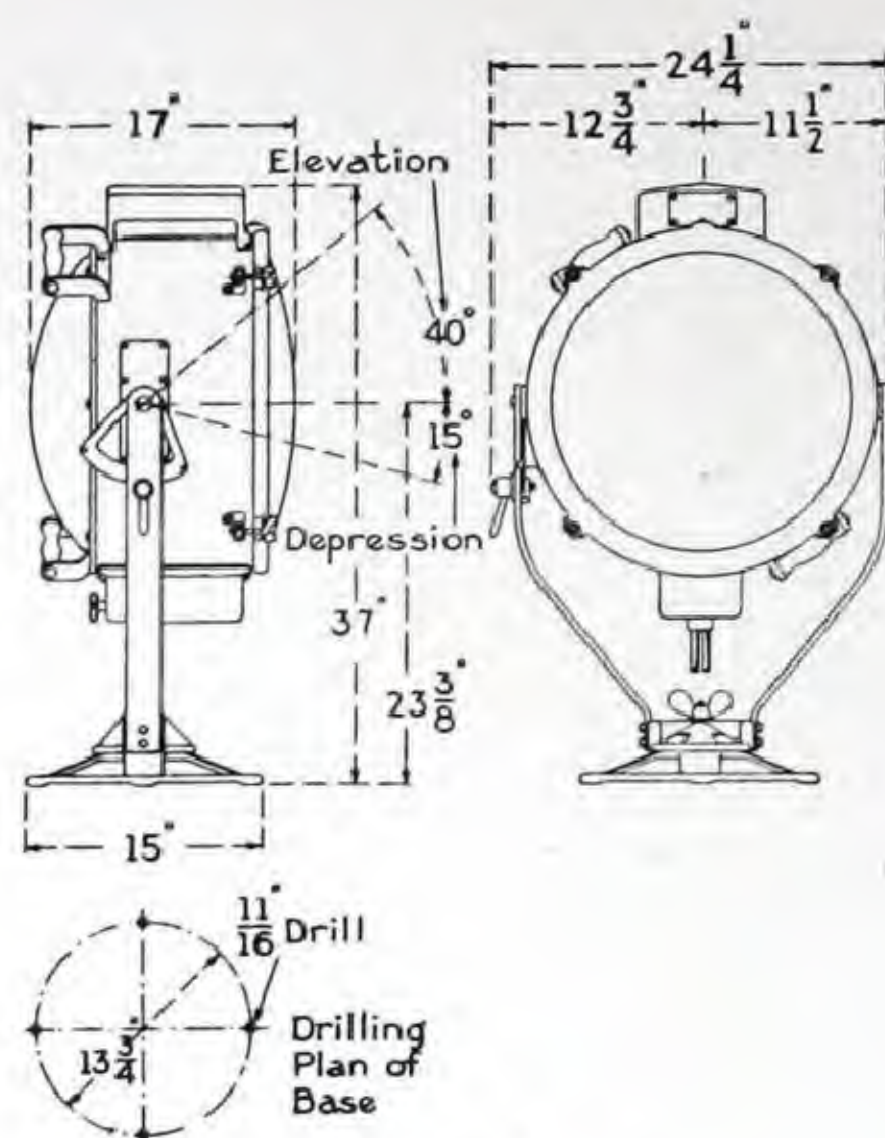


Fig. 7
(P-1257762)
18-in. Hand-control Incandescent Searchlight with Swivel and Trunnion Base

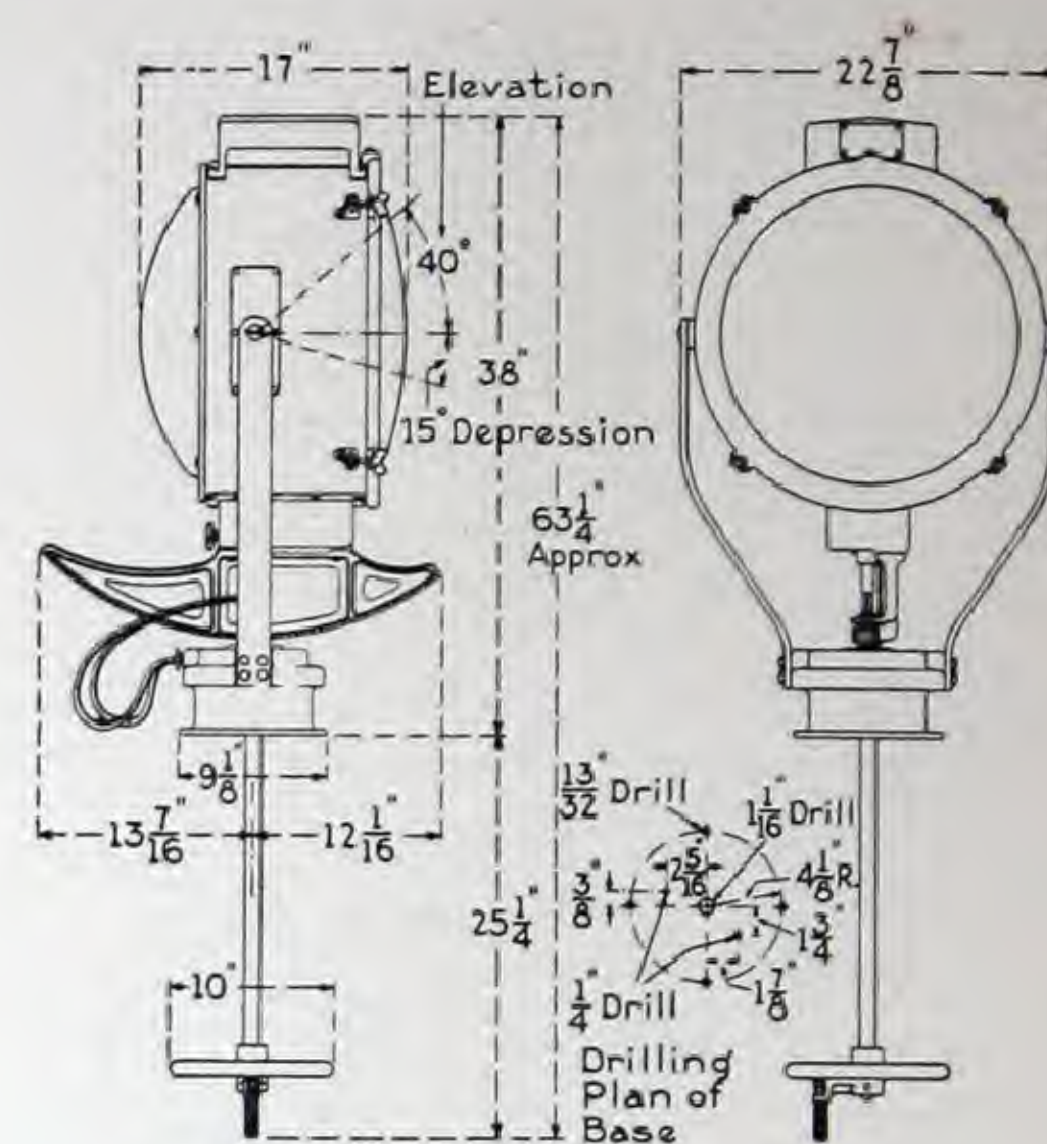


Fig. 8
(P-1256096)
18-in. Pilot-house Control Incandescent Searchlight

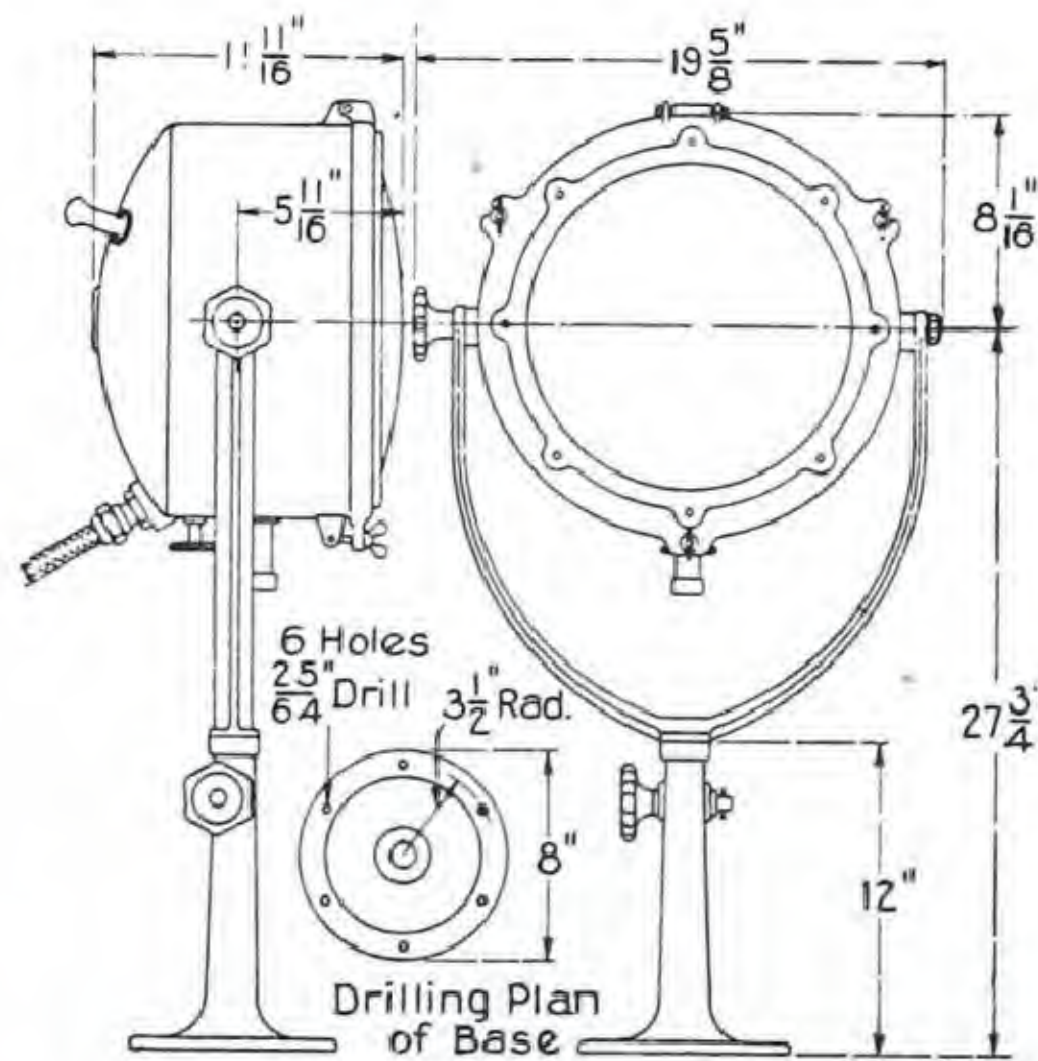


Fig. 9
(K-1272663)
12-in. Hand-control Incandescent Searchlight Form J-69

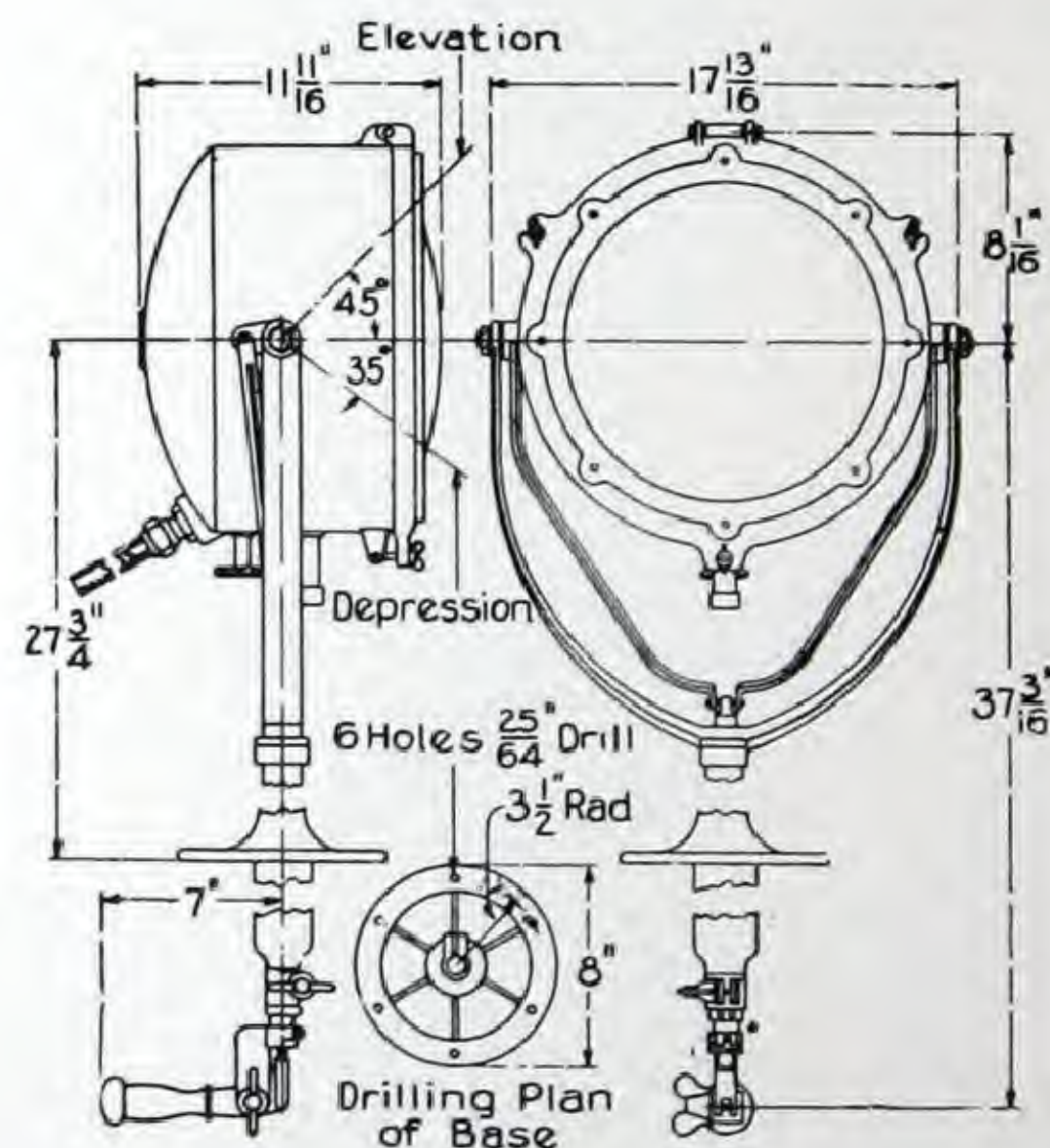


Fig. 10
(K-1272540)
12-in. Pilot-house Control Incandescent Searchlight Form J-68

NOVALUX INCANDESCENT SEARCHLIGHTS

ILLUSTRATIONS



Fig. 1
(Photo No. 272477)
Hand-control 18-in. Incandescent
Searchlight
(Pedestal Mounting)



Fig. 2
(Photo No. 275345)
Hand-control 18-in. Incandescent
Searchlight
(Swivel and Trunnion Mounting)



Fig. 3
(Photo No. 274987)
Pilot-house Control 18-in. Incandescent
Searchlight



Fig. 4
(Photo No. 275681)
Hand-control 12-in. Incandescent
Searchlight
Form J-69



Fig. 5
(Photo No. 273397)
Pilot-house Control 12-in. Incandescent
Searchlight
Form J-68

GENERAL ELECTRIC COMPANY

GENERAL OFFICE: SCHENECTADY, N. Y.

SALES OFFICES (Address nearest Office)

Akron, Ohio.....	159 South Main Street	Memphis, Tenn.....	130 Madison Avenue
Atlanta, Ga.....	123 Spring Street	Miami, Fla.....	25 Southeast Second Street
Baltimore, Md.....	39 West Lexington Street	Milwaukee, Wis.....	425 East Water Street
Birmingham, Ala.....	602 North Eighteenth Street	Minneapolis, Minn.....	107 Fifth Street, South
Bluefield, W. Va.....	104 Federal Street	Nashville, Tenn.....	234 Third Avenue, North
Boston, Mass.....	84 State Street	Newark, N. J.....	20 Washington Place
Buffalo, N. Y.....	39 East Genesee Street	New Haven, Conn.....	129 Church Street
Butte, Mont.....	40 East Broadway	New Orleans, La.....	837 Gravier Street
Canton, Ohio.....	700 Tuscarawas Street, West	New York, N. Y.....	120 Broadway
Charleston, W. Va.....	201 Capitol Street	Niagara Falls, N. Y.....	201 Falls Street
Charlotte, N. C.....	200 South Tryon Street	Oklahoma City, Okla.....	15 North Robinson Street
Chattanooga, Tenn.....	536 Market Street	Omaha, Neb.....	409 South Seventeenth Street
Chicago, Ill.....	230 South Clark Street	Philadelphia, Pa.....	1321 Walnut Street
Cincinnati, Ohio.....	215 West Third Street	Phoenix, Ariz.....	11 West Jefferson Street
Cleveland, Ohio.....	925 Euclid Avenue	Pittsburgh, Pa.....	535 Smithfield Street
Columbus, Ohio.....	17 South High Street	Portland, Ore.....	329 Alder Street
Dallas, Tex.....	1801 North Lamar Street	Providence, R. I.....	76 Westminster Street
Davenport, Iowa.....	111 East Third Street	Richmond, Va.....	700 East Franklin Street
Dayton, Ohio.....	25 North Main Street	Rochester, N. Y.....	89 East Avenue
Denver, Colo.....	650 Seventeenth Street	St. Louis, Mo.....	112 North Fourth Street
Des Moines, Iowa.....	418 West Sixth Avenue	Salt Lake City, Utah.....	200 South Main Street
Detroit, Mich.....	700 Antoinette Street	San Antonio, Tex.....	601 Navarro Street
Duluth, Minn.....	14 West Superior Street	San Francisco, Cal.....	116 New Montgomery Street
Elmira, N. Y.....	342 East Water Street	Schenectady, N. Y.....	1 River Road
El Paso, Tex.....	109 North Oregon Street	Seattle, Wash.....	811 First Avenue
Erie, Pa.....	10 East Twelfth Street	Spokane, Wash.....	423 Riverside Avenue
Fort Wayne, Ind.....	1635 Broadway	Springfield, Mass.....	1387 Main Street
Grand Rapids, Mich.....	201 Monroe Avenue	Syracuse, N. Y.....	113 South Salina Street
Hartford, Conn.....	18 Asylum Street	Tacoma, Wash.....	950 Pacific Avenue
Houston, Tex.....	1016 Walker Avenue	Tampa, Fla.....	112 Cass Street
Indianapolis, Ind.....	106 North Illinois Street	Terre Haute, Ind.....	701 Wabash Avenue
Jackson, Mich.....	212 Michigan Ave., West	Toledo, Ohio.....	520 Madison Avenue
Jacksonville, Fla.....	11 East Forsyth Street	Tulsa, Okla.....	409 South Boston Street
Kansas City, Mo.....	1004 Baltimore Avenue	Utica, N. Y.....	239 Genesee Street
Knoxville, Tenn.....	602 North Gay Street	Washington, D. C.....	1405 G Street, Northwest
Little Rock, Ark.....	223 West Second Street	Waterbury, Conn.....	195 Grand Street
Los Angeles, Cal.....	5201 Santa Fe Avenue	Worcester, Mass.....	340 Main Street
Louisville, Ky.....	455 South Fourth Street	Youngstown, Ohio.....	16 Central Square

Canada: Canadian General Electric Company, Ltd., Toronto

Hawaii: W. A. Ramsay, Ltd., Honolulu.

Motor Dealers and Lamp Agencies in all large cities and towns.

SERVICE SHOPS

Atlanta.....	91 Glenn Street	Los Angeles.....	5203 Santa Fe Avenue
Buffalo.....	318 Urban Street	Minneapolis.....	410 Third Ave., North
Chicago.....	509 East Illinois Street	New York.....	627 Greenwich Street
Cincinnati.....	215 West Third Street	Philadelphia.....	1223 Washington Avenue
Cleveland.....	1133 East 152nd Street	St. Louis.....	1009 Spruce Street
Dallas.....	1801 North Lamar Street	Salt Lake City.....	370 West Second South Street
Detroit.....	700 Antoinette Street	Seattle.....	1508 Fourth Ave. South
Kansas City.....	819 East Nineteenth Street		

Special service divisions are also maintained at the following works of the Company: Bloomfield, N. J.; Erie, Pa.; Ft. Wayne, Ind.; Oakland, Calif.; Pittsfield, Mass.; Schenectady, N. Y.; and West Lynn, Mass.,—River Works and West Lynn Works.

BROADCASTING STATIONS

WGY, Schenectady, N. Y. KOA, Denver, Colo. KGO, Oakland, Calif.

Distributors for the General Electric Company outside of the United States and Canada

INTERNATIONAL GENERAL ELECTRIC COMPANY, INC.

New York City, 120 Broadway

General Sales Offices, Schenectady, N. Y.

FOREIGN OFFICES AND ASSOCIATED COMPANIES

ARGENTINA: General Electric, S. A., Buenos Aires, Cordoba, Rosario de Santa Fé, and Tucuman
 AUSTRALIA: Australian General Electric Company, Ltd., Sydney, Melbourne, Adelaide, Brisbane, and Newcastle
 BELGIUM AND COLONIES: Societe d'Electricite et de Mecanique (Procedes Thomson-Houston & Carcel)
 Societe Anonyme, Brussels, Belgium
 BRAZIL: General Electric, S. A., Rio de Janeiro, and Sao Paulo
 CENTRAL AMERICA: International General Electric Co., Inc., New Orleans, La.
 CHILE: International Machinery Company, Santiago, Antofagasta and Valparaiso; Nitrate Agencies, Ltd., Iquique
 CHINA: Andersen, Meyer & Company, Ltd., Shanghai; China General Edison Company, Shanghai
 COLOMBIA: Wesselhoeft & Poor, Bogota, Barranquilla, and Medellin
 CUBA: General Electric Company of Cuba, Havana, and Santiago de Cuba
 DUTCH EAST INDIES: International General Electric Company, Inc., Soerabaya, Java
 ECUADOR: Guayaquil Agencies Co., Guayaquil
 EGYPT: British Thomson-Houston Company, Ltd., Cairo
 FRANCE AND COLONIES: Compagnie Francaise Thomson-Houston, Paris; International General Electric Co., Inc., Paris
 GERMANY: International General Electric Co., Inc., Berlin
 GREAT BRITAIN AND IRELAND: International General Electric Co., Inc., British Thomson-Houston Co., Ltd., London, W.C.2;
 British Thomson-Houston Co., Ltd., Rugby
 GREECE AND COLONIES: Compagnie Francaise Thomson-Houston, Paris, France
 HOLLAND: Mijnsen & Co., Amsterdam
 INDIA: International General Electric Company, Inc., Calcutta, Bombay, and Bangalore
 ITALY AND COLONIES: Compagnia Generale Di Eletticità, Milan
 JAPAN: Shibaura Engineering Works, Tokyo; Tokyo Electric Company, Ltd., Kawasaki, Kanagawa-Ken; International
 General Electric Co., Inc., Tokyo, Osaka
 JAVA: International General Electric Co., Inc., Soerabaya
 MEXICO: General Electric, S. A., City of Mexico, Guadalajara, Monterrey, Tampico, Vera Cruz, and El Paso, Texas
 NEW ZEALAND: National Electrical and Engineering Company, Ltd., Auckland, Dunedin, Christchurch, and Wellington
 PARAGUAY: General Electric, S. A., Buenos Aires, Argentina
 PERU: W. R. Grace & Company, Lima
 PHILIPPINE ISLANDS: Pacific Commercial Company, Manila
 PORTO RICO: International General Electric Company, Inc., San Juan
 PORTUGAL AND COLONIES: Sociedade Iberica de Construcões Electricas Lda., Lisbon
 SOUTH AFRICA: South African General Electric Company, Ltd., Johannesburg, and Capetown
 SPAIN AND COLONIES: Sociedad Iberica de Construcciones Electricas, Madrid, Barcelona, and Bilbao
 SWITZERLAND: Trollet Freres, Geneva
 URUGUAY: General Electric, S. A., Montevideo
 VENEZUELA: Wesselhoeft & Poor, Caracas